ELIM. OBJECTIVE:
MULT. 1 OR Both
EQ'S TO ELIM. 1 VARIABLE,

2023 KEY

Solve each system by elimination. Check both equations with your calculator!!!!

1) $10x + 9y = 5$ ⟶ $10x + 9y = 5$
$-2(5x + 7y = -10)$ ⟶ $-10x - 14y = 20$

X ELIMINATED

$-5y = 25$
$-5 \quad -5$

$$y = -5$$

FIND X
(use either eq):

$10x + 9(-5) = 5$

$10x - 45 = 5$
$\quad +45 \quad +45$

$\dfrac{10x = 50}{10 \quad 10}$

$$x = 5$$

Check: Plug into calc
+ check BOTH ORIG. EQUATIONS

2) $(5x + 15y = 15) \times -6$ ⟶ $-30x - 90y = -90$
$(6x + 18y = 18) \times 5$ ⟶ $30x + 90y = 90$

$0 = 0$ ⓣ

INFINITE SOLUTIONS

Why? b/c the variable dropped out, and the stmt is true.

3) $(-7x - 3y = 4) \cdot 5$ ⟶ $-35x - 15y = 20$
$(5x - 2y = 22) \cdot 7$ ⟶ $+35x - 14y = 154$

$\dfrac{-29y = 174}{-29 \quad -29}$

$$y = -6$$

FIND X:

$5x - 2(-6) = 22$

$5x + 12 = 22$
$\quad -12 \quad -12$

$\dfrac{5x = 10}{5 \quad 5}$

$$x = 2$$

4) $(-7x + 6y = -9) \times -2$ ⟶ $14y - 12y = 18$
$-14x + 12y = -16$ ⟶ $-14y + 12y = -16$

$0 \neq 2$

NO SOLUTION

why? b/c the variable dropped out and the stmt is FALSE.

Solve each system by elimination. Check Algebraically.

5) $-5x - y = 3 \longrightarrow -5x - y = 3$
$(-4x - y = 2) \cdot -1 \rightarrow 4x + y = -2$

$\dfrac{-x = 1}{-1} \quad \dfrac{}{-1}$

$\boxed{X = -1}$

FIND Y

$-5(-1) - y = 3$
$5 - y = 3$
$-5 \quad -5$
$\dfrac{-y = -2}{+1 \quad -1} \quad \boxed{y = 2}$

6) The water park is a popular field trip destination. This year the senior class at High School A and the senior class at High School B both planned trips there. The senior class at High School A rented and filled 8 vans and 8 buses with 272 students. High School B rented and filled 9 vans and 11 buses with 358 students. Every van had the same number of students in it as did the buses. Find the number of students in each van and in each bus.

KI: HSA: Rented 8 vans + 8 buses; 272 seniors
HS B: Rented 9 vans + 11 buses; 358 seniors

$X = $ # students per van
$Y = $ # students per bus

EQ's

HSA: $(8x + 8y = 272) * 9 \rightarrow 72x + 72y = 2448$
HS B: $(9x + 11y = 358) * -8 \rightarrow -72x - 88y = -2864$

$\dfrac{-16y = -416}{-16 \qquad -16}$

$\boxed{y = 26}$

FIND X
$8x + 8(26) = 272$
$8x + 208 = 272$
$\dfrac{-208 \quad -208}{}$
$\dfrac{8x = 64}{8 \quad 8} \quad \boxed{X = 8}$

Sentence
The van fits 8 students and the bus fits 26 students

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